MIHIR V PHADNIS
8181111028
TE COMPS S

1. What are different types of Topologies:

The term 'physical topology' refers to the way in which Network is laid out physically.
The topology is actually physical representation of Relationship Between links and Linking Devices. (Usually called Nodes) To one another.

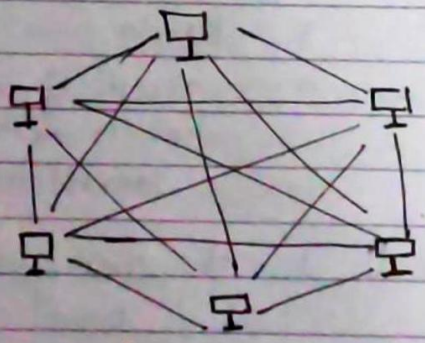
Types of Topology:

1. Mesh topology: Every device has a dedicated point to point link to every other device:

Dedicated ie, link carries traffic only Between the two devices which connects.

Total No. of physical links with n nodes in Mesh topology is = $\frac{n(n-1)}{2}$

.physical (Diagramatic) connection model:



n = 6
links = 15

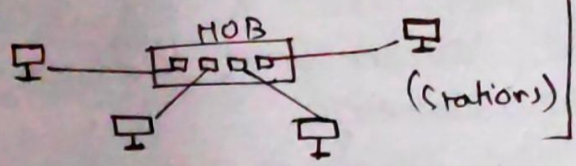
Advantages:
1 dedicated links
2 Near Nonexistant traffic
3 Privacy / Security
4 Fault Identification is Extremely Easy.
5 Robust : one fault does Not make System Unusable

2. Disadvantages of Mesh topology:

1. High amount for cabling
2. High/Expensive Hardware for connections.
3. Not phesible for more than 10 connections (stations)

2 Star topology: In this topology each device has a dedicated point to point link to a central controller usually called a Hub. These devices are not usually Directly linked to one another.

Diagram



Advantages: 1: less expensive than Mesh topology:

2: Device only Needs 1 connection & one I/O port In order to connect other devices.

3: Easy to Install, recondigure

4. robust, if one link fails only that link is affected (Easy fault Identification)

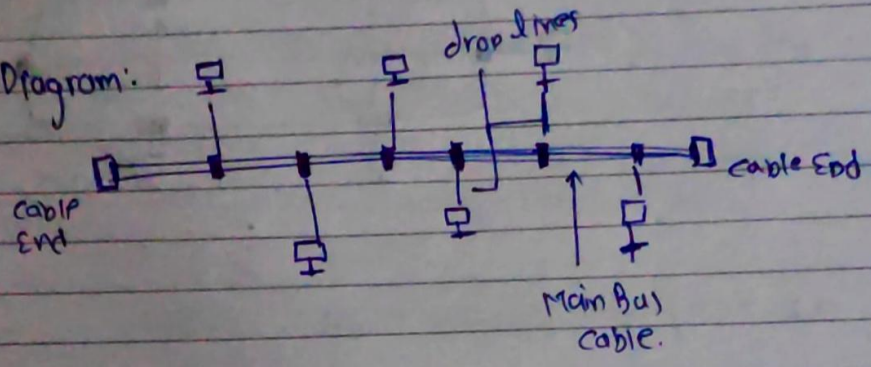
Disadvantages: 1 If Hub goes Down, System goes Dead.

2. Far more Cabling is required than other topologies (eg. ring, Bus)

3: Bus topology: It is example of multipoint topology. One cable acts as backbone to link all Devices in a Network:

Nodes are connected to Bus Cable by Drops lines & Taps. Drop line is connection Between Device & Main Bus Cable.

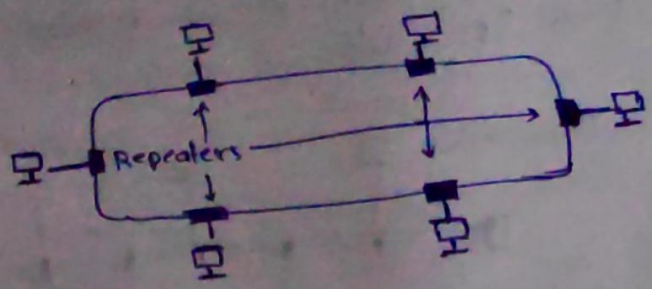
Diagram:



Advantages: 1 Ease of Installation
2 less distance from Bus Cable

Disadvantages: 1. Fault Isolation is Hard
2. If Bus fails signal retransmits Back to Devices which can cause Noisy Signal

Ring topology: Each Device Has Dedicated point to point Connection with two Devices on either Side of it. Signal is passed along ring in one direction, until it reaches Destination.



a2 TCP/IP Refrence Model:

TCP I/P is a protocol Suite (a set of protocol organised in different layers.) Used in the internet.
It is Defined as 4 software layers Built upon Hardware: Today TCPIP is thought as 5 layer Model.

Layered Architecture

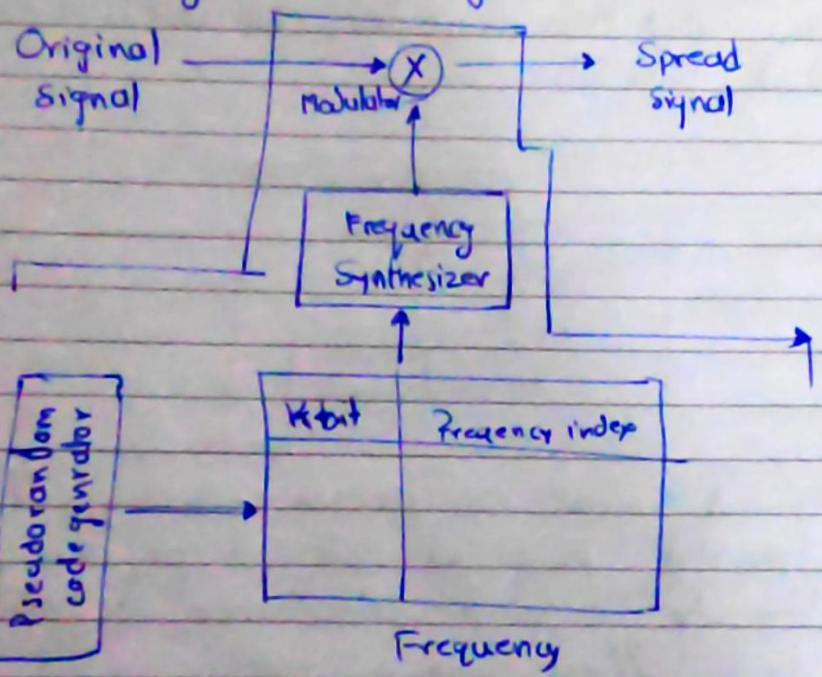
Re:

Minimum code execution Management.

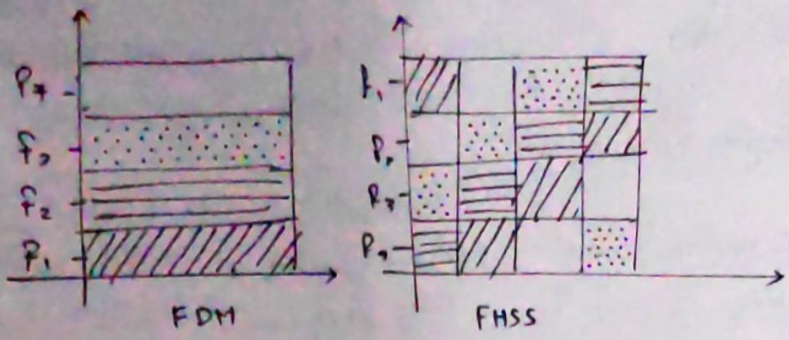
(a) original layers		(b) Layers Used now
Application	⟷	Application
Transport	⟷	Transport
Internet	⟷	Network
Network Interface	⟷	Data Link
Hardware Devices	⟷	Physical

Q3] The Frequency Hopping spread Spectrum is a technique (FHSS) which uses M different Carrier Frequencies that are modulated by Source Signal. At one Moment, Signal Modulates Another Carrier Frequency

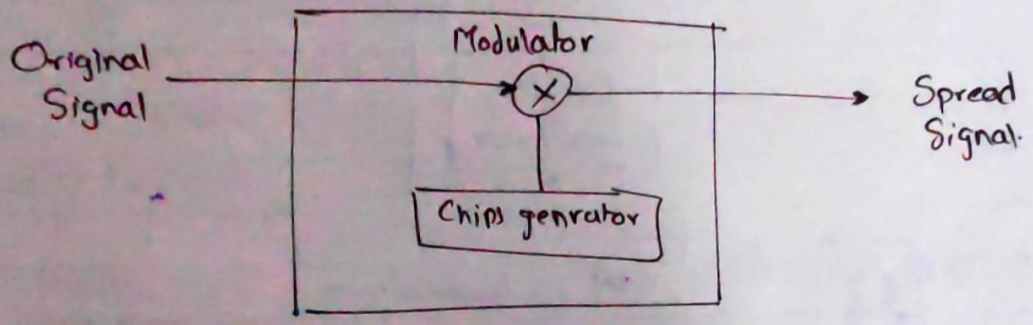
A pseudorandom Code Generator called pseudorandom Noise (PN) creates a K Bit pattern for Every Hopping period T_h. THe Frequency Table Uses pattern to find the Frequency to be Used for this hopping period and passes through the Frequency Synthesizer. The Frequency Synthesizer creates a Carrier Signal of that Frequency & Source Signal Modulates Carrier Signal



Bandwidth Sharing:



Q7 → IN Direct Sequence Spread Spectrum (DSSS), Each Data Bit is replaced with 'N' Bits Using Spread Code. In other words each bit is assigned a Code of N bits, called Chips where the Chip rate is N' times that of Data Bit.



The Spread Signal can provide privacy if Intruder does Not Knows the Code It can also provide Immunity against Interference if each Station Uses different Code.

05 Difference Between Switch and router.

Key Differences Between Switch and router:

SWITCH	ROUTER
Main objective is to Connect Various Devices Simultaneously	Main objective is to Connect Various Networks Simultaneously
Works in Datalink layer	Works in Network layer
Router is Used by LAN as well as WAN	SWITCH IS USED BY LAN ONLY
Data is Sent through Packet & FRME	Data is Sent through packet.
No Collision takes place in Full Duplex Switch	Less Chance of Collision in Router.
Types: Circuits, Packet & Message Switching	Types: Adaptive, Non Adaptive .etc.

Q6 Difference Between OSI Model and TCP/IP Model:

OSI	TCP/IP
① Generic Model Based on Functionality of Each layer	TCP/IP is protocol oriented Standard / Suite
② OSI Model Distinguishes 3 Layers : Services, Interfaces & protocol	IN TCP/IP there's No clear Distinction betn them.
③ OSI Model Gives Guidelines on How Communication Needs to Be done, whereas,	TCP/IP Model, layout Standards on which Internet was Developed, So it is more practical
④ Model was developed first and then protocols in Each layer Were Developed:	IN TCP/IP Suite, Protocols were Developed first then Model was developed
⑤ OSI Distinguishes Betn 3 layers: Session, presentation & Application, when Implemented, it Didn't Showed any Improved performance to Switch from TCP/IP	TCP IP is More than one Transport Layer protocols. Some of functionalities of Session layer are available in some of transport layer Protocols.

Q7 Which TCP/IP Layer is Responsible for Functioning of Routing

(a) Determine the Best path to route the packets.
→ Network layer, Because it only determines connection Between Hosts

(b) Providing end to End process Communication with Reliable Services
→ TRANSPORT LAYER

(c) Error Control & Flow Control →
TRANSPORT LAYER By using UDP

(d) Provides Acess to End User: → Application Layer

(e) File transfer
→ The transport Layer.

Q8 Specify Following to One or more layers of TCP/IP model.

a) Transmission of bit Stream across Medium
→ Data link Layer; Transport Layer.

b) Define Frames, Error detection & retransmission of frames) → Transport Layer, Network layer.

C) Reliable Process-to-process Mesage Delivery:
→ Network Layer.

D) Route Selection, Delivery of IP packets From Source to Destination
→ Network Layer, Transport layer

E) Provides User services, such as E-mail & File transfer
→ The Transport layer &
The Application Layer.